Lab Course / “Praktikum”: 
*Project Management and Software Development for Medical Applications*

**Introduction – SS2021**

Conducted by: 
Ardit Ramadani, Zhongliang Jiang, Lennart Bastian and Tianyu Song 
Prof. Dr. Nassir Navab - CAMP

Munich, 12th of April 2021
Work with clinicians on real-world medical applications

Improve your project management and presentations skills
Lecture Structure

- **4 lectures** by course tutors *(recommended to attend)*
  - Introduction (Administrative, Requirements, Grading) – **Mandatory**
  - Project Management & Presentation Tips
  - Introduction to Software Engineering - Unified Modeling Language (UML)
  - Introduction to Software Engineering - Documentation, Tests, Design Patterns & Integration Strategy

- **3 presentations** by students *(Mandatory)*
  - Requirements (5 mins)
  - Intermediate (7 minutes)
  - Final (incl. demo) (10 minutes)

- Minimum **10 hours per week** of project work during the semester
CoVid-19 related announcements

• Due to the CoVid-19 outbreak and subsequent government measures, short term changes might be necessary
  – Follow the announcement section on the website of the course
  – Check emails regularly

• As of today (12 April 2021) we are planning
  – Purely virtual lectures and presentations conducted via TUM Zoom
  – Zoom details will be provided one day before the sessions via email
  – Presence might be required by supervisors depending on the Project
    • not guaranteed 100% online course
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Place</th>
<th>Topic</th>
<th>Conducted by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, 12.04.2021</td>
<td>11:00 - 12:00</td>
<td>Zoom</td>
<td>Lecture 1: Introduction and Project Announcement</td>
<td>Course tutors</td>
</tr>
<tr>
<td></td>
<td>(updated)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Tuesday, 13.04.2021</td>
<td>09:00 - 12:00</td>
<td>Zoom</td>
<td>Lecture 2: Presentation Tips and Project Management Lecture 3: UML</td>
<td>Zhongliang Jiang Lennart Bastian</td>
</tr>
<tr>
<td>Friday, 16.04.2021</td>
<td>23:59 CEST</td>
<td>Email</td>
<td>Deadline to send project preferences</td>
<td>Seminar Participants</td>
</tr>
<tr>
<td>Monday, 26.04.2021</td>
<td>09:00 - 12:00</td>
<td>Zoom</td>
<td>Requirements Presentation</td>
<td>Seminar Participants</td>
</tr>
<tr>
<td>Tuesday, 27.04.2021</td>
<td>10:00 - 12:00</td>
<td>Zoom</td>
<td>Lecture 4: Documentation, Tests, Design Patterns &amp; Integration Strategy</td>
<td>Ardit Ramadani</td>
</tr>
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<td>Monday, 31.05.2021</td>
<td>09:00 - 12:00</td>
<td>Zoom</td>
<td>Intermediate Presentations Part I</td>
<td>Seminar Participants</td>
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<td>Tuesday, 01.06.2021</td>
<td>09:00 - 12:00</td>
<td>Zoom</td>
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<td>Seminar Participants</td>
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<tr>
<td>Monday, 12.07.2021</td>
<td>09:00 - 12:00</td>
<td>Zoom</td>
<td>Final Presentations Part I</td>
<td>Seminar Participants</td>
</tr>
<tr>
<td>Tuesday, 13.07.2021</td>
<td>09:00 - 12:00</td>
<td>Zoom</td>
<td>Final Presentations Part II</td>
<td>Seminar Participants</td>
</tr>
</tbody>
</table>
Timeline

**Project Start**
L1: Introduction and Project Announcement

L2: Presentation Tips and Project Management
L3: UML

L4: Documentation, Tests, Design Patterns & Integration Strategy

**Deadline to send project preferences**

**Requirements Presentation**

**Intermediate Presentations Part I**

**Intermediate Presentations Part II**

**Final Presentations Part I**

**Final Presentations Part II**

**Project End**
Projects will be on Software Development in Medical Applications

- Involves “Medical Application” and “Software Development”
- In collaboration with Hospital or Industry or Research Institute
- In the previous years, example projects were based on:
  - Image Analysis (Registration, Segmentation, Quantification)
  - Graphical User Interface design
  - Mobile App Development
  - Robotics
  - Machine Learning, Deep Learning
  - Computer Vision
  - Image Reconstruction
  - Simulations and Modeling
  - Augmented Reality
  - Computer Graphics
## Project proposals

### Summer Semester 2020

<table>
<thead>
<tr>
<th>Source</th>
<th>Number of projects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academia</td>
<td>21</td>
<td>91%</td>
</tr>
<tr>
<td>Industry</td>
<td>2</td>
<td>9%</td>
</tr>
</tbody>
</table>

23 total projects  
1 company from industry participated  
2 students got employed as working student

### Winter Semester 2020/2021

<table>
<thead>
<tr>
<th>Source</th>
<th>Number of projects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academia</td>
<td>17</td>
<td>80%</td>
</tr>
<tr>
<td>Industry</td>
<td>4</td>
<td>20%</td>
</tr>
</tbody>
</table>

21 total projects  
3 companies from industry participated  
5 students got employed as working student

### Summer Semester 2021

<table>
<thead>
<tr>
<th>Source</th>
<th>Number of projects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academia</td>
<td>17</td>
<td>63%</td>
</tr>
<tr>
<td>Industry</td>
<td>10</td>
<td>37%</td>
</tr>
</tbody>
</table>

27 total projects  
5 companies from industry participated
You are a Project Manager as well as a Software Developer

• Make and follow your project **plan**
  – Gather requirements
  – Set goals and tasks
  – Derive milestones
  – Make Gantt chart (project time plan)

• **Design** and **implement** the software
  – Design patterns, use case and class diagram
  – Programming in higher level languages (C/C++, Python, Java, Matlab etc.)
  – Development tools like IDEs, version control (GIT) etc.

• Present your work to the **course tutors** and **supervisors**
  – 3 presentations: Requirements, Intermediate, Final (with demo)
Project Assignment

• Project proposals will be announced in the web-site of the course Today
  – Send us your application with 3 preferred projects and motivation until FRIDAY, 16.04.2021, 23:59 CEST
  – Find application form under Downloads > “Student project application template”

• We will try to assign students one project from their preferences
  – Mixture of “FCFS” and maximization of first choices
  – There is no guarantee that you will get one of your preferences

• Students must discuss the projects with their assigned supervisors as soon as possible
<table>
<thead>
<tr>
<th>Choice</th>
<th>Number of students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st choice assigned</td>
<td>10 students</td>
<td>56%</td>
</tr>
<tr>
<td>2nd choice assigned</td>
<td>6 students</td>
<td>33%</td>
</tr>
<tr>
<td>3rd choice assigned</td>
<td>2 students</td>
<td>10%</td>
</tr>
<tr>
<td>no submission</td>
<td>0 student</td>
<td>0%</td>
</tr>
</tbody>
</table>

*Tab. Percentage of assigned projects based on student’s preferences*

<table>
<thead>
<tr>
<th>Choice</th>
<th>Number of students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st choice assigned</td>
<td>10 students</td>
<td>50%</td>
</tr>
<tr>
<td>2nd choice assigned</td>
<td>7 students</td>
<td>35%</td>
</tr>
<tr>
<td>3rd choice assigned</td>
<td>2 students</td>
<td>10%</td>
</tr>
<tr>
<td>no submission</td>
<td>1 student</td>
<td>5%</td>
</tr>
</tbody>
</table>

*Tab. Percentage of assigned projects based on student’s preferences*
Grading

• This course has **10 ECTS**
  – Equivalent to **10 – 14 hours per week** for **3 – 4 months**

• **Project Supervisor** will grade based on performance (weight: **50%**)
  – Requirement coverage
  – Implementation on time
  – Completion of the project goals
  – Regular communication

• **Course Tutors** will grade based on presentations (weight: **50%**)
  – Fundamental requirements met (citations, correctness, formatting)
  – Presentation skills (get the message across)
  – Slides (proper layout of text and visual information, consistency)
  – Content (for example: introduction, software design, tasks, project management)
  – Time Management (presentation time management and project time management)
  – Course attendance
Grading (continued)

• Attendance to all presentations is **mandatory** (even if you are not presenting)
  – Every unexcused absence: – 0.3 on tutor grading
  – **Excuses**: Illness, funeral, civic duties, reasons beyond your influence (accident, earthquake...), work meeting that cannot be moved
  – **No Excuse**: overslept, holidays, don’t want to join
  – In any case, inform us in time and get a certificate

• **Good conduct**
  – Complete all assignments
  – Presentation dates cannot be moved – you get a slot, you take it
  – Follow the presentation rules
  – Upload your presentation slides at link provided latest by the deadline given
  – Convince us that you want a good grade: layout and content matter!
  – Presenting with camera is a plus
Presentation times

- Requirement presentation – 5 minutes
- Intermediate presentation – 7 minutes
- Final presentation – 10 minutes
- Exceeding the time will be penalized
  - All times are including presentation time and demos (when applicable)
  - We will interrupt your presentation at 30s overtime
  - You need to present for at least 30s less than the time indicated
    - if you are faster, we will wait until time is over
Etiquette

• Always be polite
  – To your fellow students
  – To your supervisors

• Send polite e-mails
  – Properly motivate your request
  – Write full sentences
  – Be patient for an answer
  – Teaching is not our only duty

• If you want a favorable answer, be polite.
Please follow the course webpage or write to us if you have specific questions

- Website
  - [https://wiki.tum.de/pages/viewpage.action?pageId=720963204](https://wiki.tum.de/pages/viewpage.action?pageId=720963204)

- Course tutors

  - Ardit Ramadani
    - ardit.ramadani@tum.de
  - Zhongliang Jiang
    - zl.jiang@tum.de
  - Lennart Bastian
    - lennart.bastian@tum.de
  - Tianyu Song
    - tianyu.song@tum.de
Thank you